

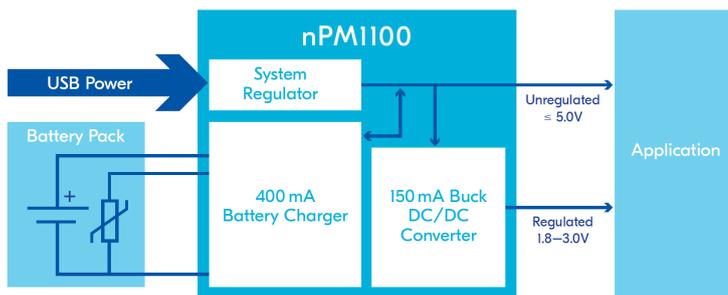
# nPM1100

Extremely compact Power Management IC (PMIC)  
with power path and charging.

## Key benefits

- Combined USB battery charging and power supply with as little as 23mm<sup>2</sup> PCB area including passives
- 100 % pin configurable, no software needed
- Prolongs battery life of any nRF52<sup>®</sup> or nRF53<sup>®</sup> Series SoC based application using a rechargeable battery
- Provides ample current for both the SoC and additional circuitry

## Block diagram



## Overview

The nPM1100 is a dedicated power management IC (PMIC) with dual-mode configurable buck regulator and integrated battery charger. It is designed as a complementary component to Nordic's nRF52<sup>®</sup> Series and nRF53<sup>®</sup> Series System-on-Chips (SoCs) to ensure reliable power delivery and stable operation, whilst maximizing battery life through high efficiency and low quiescent currents.

The dual-mode regulator operates at up to 92% power conversion efficiency, prolonging battery life of any nRF52<sup>®</sup> or nRF53<sup>®</sup> SoC based application using a rechargeable battery. Hysteretic mode reduces current consumption for low load conditions, while PWM mode allows for cleaner power operation and better performance for higher loads. The regulator can deliver up to 150 mA, efficiently providing ample current for the nRF52<sup>®</sup> or nRF53<sup>®</sup> Series SoC plus additional circuitry.

The device can also be used as a generic PMIC for any rechargeable application. Its extremely compact form factor makes it ideal for advanced wearables, connected medical devices, and other size constrained applications. When optimized for size, PCB area usage can be as low as 23 mm<sup>2</sup> with passive components included. This increases to approximately 27 mm<sup>2</sup> when optimized for performance.

## Key features

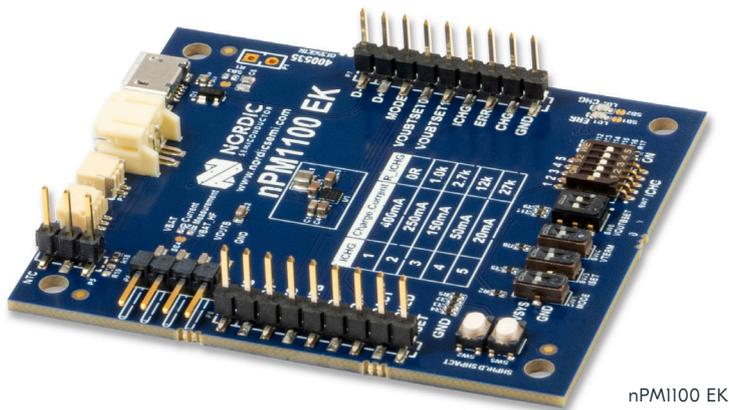
- Ultra-small form factor PMIC
  - 2.075 × 2.075 mm WLCSF package
- 400 mA battery charger
  - Automatic charging mode
  - For Li-ion and Li-Polymer batteries
  - Battery thermal protection
- Highly efficient regulator
  - Up to 92 % power conversion efficiency
  - Hysteretic and PWM mode
  - Selectable output voltage
  - 150 mA current limit
- Input regulator with USB support
  - SDP, CDP, DCP port detection
  - Overvoltage protection
- Ship mode that disables power output
- Drivers for charge and error LEDs
- -40°C to 85°C operating temperature

## Applications

- Wearables
- Remote controls
- Personal medical devices
- Smart home sensors

## Specification

<b>Battery charger</b>	
Regulatory compliance	JEITA compliant
Termination voltage	4.1 V or 4.2 V selectable
Charge current	20 mA to 400 mA
<b>Input regulator</b>	
Input voltage	4.1 to 6.7 V
Output voltage	3.0 to 5.5 V unregulated
Overvoltage protection	20 V transient
USB current limit	100 mA or 500 mA
<b>Buck regulator</b>	
Output voltage	1.8, 2.1, 2.7 or 3.0 V
Current limit	150 mA output
Quiescent currents	800 nA typical, 460 nA in ship mode
Battery voltage	2.3 V to 4.35 V
Operating temp	-40°C to 85°C



nPM1100 EK

### nPM1100 Evaluation Kit

The nPM1100 Evaluation Kit (EK) is a tool for evaluating the nPM1100 and its features in your application. The kit features switches for all selectable settings, buttons to enter and exit ship mode and connectors for batteries, USB and headers for all pins on the PMIC.

The EK allows for testing of the nPM1100 PMICs capabilities with existing applications without the need for creating custom hardware. The board supports charging batteries and powering applications with the included headers and battery connectors. It can be powered three ways:

- By USB power via the on-board micro-USB port
- From an external DC power supply through header pins
- From battery power via one of the headers

The kit further includes buttons to enter and exit the PMICs ship mode together with DIP-switches for all configuration options such as selecting the charger termination voltage, regulator output voltage, charge current and VBUS current limit, and fixing the buck regulator mode to PWM mode only. The kit also includes indicator LEDs for charge and error indication.

There is no programmable logic on the board, hence setup requires no programming for testing with existing hardware applications. The EK is designed for optimized performance. Refer to Nordic whitepaper [nWP040](#) for inductor choices that allow for a trade-off between maximum performance and minimum size implementations.

### Key features

- nPM1100 PMIC
  - All features enabled
  - Performance optimized layout
- 400 mA battery charger
- Highly efficient buck regulator
- Input regulator that supports USB charging
- Low quiescent currents
- Requires no software to operate
- I/O
  - Pin headers to all pins on nPM1100
  - USB connector & battery connectors
- LEDs for charge and error indication
- Switches
- ICHRG, VTERM, ISET, VOUTB and MODE
- Buttons to enter and exit ship mode

### Order Information

nPM1100 PMIC	Get in touch with our distributor network
nPM1100 Evaluation Kit	Directly available through distributors

### Related Products

nRF5340 SoC	Dual-core, multiprotocol SoC for Bluetooth LE, Bluetooth mesh, NFC, Thread & Zigbee
nRF52 <sup>®</sup> Series	nRF52840, nRF52833, nRF52832, nRF52820, nRF52811, nRF52810 and nRF52805 SoCs
Power Profiler Kit II	Tool for power measurement and profiling applications

## WORLD WIDE OFFICE LOCATIONS

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For more information:  
Visit [nordicsemi.com/products](http://nordicsemi.com/products) for full overview of our product range.

About Nordic Semiconductor:  
Nordic Semiconductor is a fabless semiconductor company specializing in wireless technology that powers the IoT.



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